

REMARKS

Amendment to Specification

The specification is amended to change from "scatter" to --deliver-- to correct inaccurate translation.

Claim Objections

Claims 2, 8, 9 and 10 are objected to because of the informalities.

Accordingly, we are enclosing, for your review and approval, proposed amendments to the claims to overcome the objection.

Rejections under 35 USC §103(a)

Claims 1-3 and 5-10 were rejected under 35 USC §103(a) as being obvious over Suovaniemi et al. (U.S. Patent No. 5,343,769) in view of Fischer (U.S. Patent No. 6,283,946).

Claim 1 has been amended to "moving forward and stopping the plunger over a plurality of times during a forward movement process of the plunger" and "wherein the liquid material in the metering tube is discharged from the discharge port over a plurality of times during the forward movement process of the plunger" for clarification. Thus, according to claim 1, the liquid material in the metering tube is discharged from the discharge port over a plurality of times during the forward movement process of the plunger.

Suovaniemi et al teaches the method where one delivery cycle is carried out by one sucking operation and one discharging operation of the plunger. Suovaniemi et al describes as follows:

The terminal deceleration is useful for the reason that owing to the tapering shape of the pipette's tip portion the velocity at which the level of the liquid discharges from the tip rises to very great height towards the end if the piston moves at uniform velocity, and because of this high velocity some liquid may remain on the inner surface of the liquid volume 6.

(Suovaniemi et al, col. 6, lines 3-9). According to this description, Suovaniemi et al simply teaches speed control about tapering shape structure. Suovaniemi et al does not teach or suggest "moving forward and stopping the plunger over a plurality of times during a forward movement process of the plunger."

Suovaniemi et al further describes as follows:

The terminal deceleration is useful for the reason that owing to the tapering shape of the pipette's tip portion the velocity at which the level of the liquid discharges from the tip rises to very great height towards the end if the piston moves at uniform velocity, and because of this high velocity **some liquid may remain on the inner surface of the liquid volume 6.**

The powerful deceleration caused by the abrupt stopping results in a clean, and reproducible, break of the liquid column discharging from the liquid volume 6 exactly at the end of the tip piece, without causing any droplets to cling to its outside surface.

(Suovaniemi et al, col. 6, lines 10-14). This indicates that Suovaniemi et al discusses that all the liquid in the liquid volume 6 is discharged in a single forward movement. Thus, Suovaniemi et al does not teach or suggest, among other things, "two or more liquid droplets are discharged from the nozzle in one plunger operation for discharging the liquid material" (see [0005]).

Moreover, claim 1 also recites, among other things, “providing a liquid discharging apparatus comprising a metering tube having a discharge port communicating to outside, and **a plunger whose tip face closely contacts an inner wall surface of the metering tube.**” Claim 5 also recites “**a plunger whose tip face closely contacts an inner wall surface of the metering tube.**” Regarding the recitations, the Examiner alleged as follows:

Fischer teaches a plunger (250, figs. 7A, 7B) whose tip face closely contacts the inner wall surface of the metering tube (220). A sealing gasket (260) is arranged on the tip portion of the plunger (250) to improve the closeness of the plunger tip to the inner surface of the tube (220).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide the sealing gasket of Fischer on the tip portion of the plunger of Suovaniemi et al **in order to improve the closeness of the plunger to the inner surface of the tube thereby improving the efficiency of the dispensing device**, since air and/or liquid is hindered from passing between the inner surface of tube and the plunger.

(Office Action, page 4).

However, as shown in Fig. 2 of Suovaniemi et al, the upper portion of liquid volume 6 and lower portion of liquid volume 6 communicate with each other through the clearance between the plunger and the cylinder. Therefore, a sealing gasket like Fischer cannot be attached on the tip portion of the plunger of Suovaniemi et al.

There is no reason for a person of ordinary skill in the art to combine the sealing gasket of Fischer with the pipette of Suovaniemi et al. Thus, because the rejection has not given any valid rationale to support a conclusion of obviousness, a *prima facie* case of obviousness has not been established.

For at least these reasons, claims 1 and 5 patentably distinguish over Suovaniemi et al and Fischer. Claims 2, 3 and 8 (directly or indirectly depending from claim 1), and claims 6, 7, 9 and

10 (depending from claim 5), also patentably distinguish over Suovaniemi et al and Fischer for at least the same reasons.

Claims 1-3 and 5-10 were rejected under 35 USC §103(a) as being obvious over Suovaniemi et al. (U.S. Patent No. 5,343,769) in view of Ikushima (JP 2003-126750).

The Examiner alleged as follows:

Ikushima teaches a plunger (plunger rod 11, plunger head 12 infig.4) whose tip face closely contacts the inner wall surface of the metering tube (2). A sealing member (13) is arranged on the plunger head (12) to improve the closeness of the plunger head portion (12) to the inner surface of the tube (2).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide the sealing member of Ikushima on the tip portion of the plunger of Suovaniemi et al in order to improve the closeness of the plunger to the inner surface of the tube thereby improving the efficiency of the dispensing device, since air and/or liquid is hindered from passing between the inner surface of tube and the plunger.

(Office Action, page 8). Thus the rationale is the same as the rejection over Suovaniemi et al and Fischer. As discussed regarding the sealing gasket of Fischer, it is difficult to attach the sealing member of Ikushima on the tip portion of the plunger of Suovaniemi et al.

There is no reason for a person of ordinary skill in the art to combine the sealing member of Ikushima with the pipette of Suovaniemi et al. Thus, because the rejection has not given any valid rationale to support a conclusion of obviousness, a *prima facie* case of obviousness has not been established.

For at least these reasons, claims 1 and 5 patentably distinguish over Suovaniemi et al and Ikushima. Claims 2, 3 and 8 (directly or indirectly depending from claim 1), and claims 6, 7, 9

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and 10 (depending from claim 5), also patentably distinguish over Suovaniemi et al and Ikushima for at least the same reasons.

In view of the aforementioned amendments and accompanying remarks, Applicants submit that the claims, as herein amended, are in condition for allowance. Applicants request such action at an early date.

If the Examiner believes that this application is not now in condition for allowance, the Examiner is requested to contact Applicants' undersigned attorney to arrange for an interview to expedite the disposition of this case.

If this paper is not timely filed, Applicants respectfully petition for an appropriate extension of time. The fees for such an extension or any other fees that may be due with respect to this paper may be charged to Deposit Account No. 50-2866.

Respectfully submitted,

WESTERMAN, HATTORI, DANIELS & ADRIAN, LLP



Sadao Kinashi
Attorney for Applicants
Registration No. 48,075
Telephone: (202) 822-1100
Facsimile: (202) 822-1111

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